M/037/088

DOGM RECEIVED
~ APRIL 2, 1997

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Moab District
82 East Dogwood
Moab, Utah 84532

1790
UTU-72499
(UT-060)

MAR 27 1997

Dear Interested Party:

Enclosed is a copy of the Record of Decision (ROD) prepared for the Environmental Impact Statement (EIS) for the Lisbon Valley Copper Project in San Juan County, Utah. We are sending you this information based on your interest and participation in the preparation of this EIS.

The proposed action from the Plan of Operations submitted by Summo USA Corporation, on August 8, 1995, has been approved with the modifications and alternatives specified in the enclosed ROD.

The issuance of this ROD constitutes a final decision by the Bureau of Land Management in this matter. We anticipate formal Notice of Availability of the ROD will be published in the Federal Register on April 1, 1997.

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations at 43 CFR, Part 4 and the enclosed Form 1842-1. The appellant has the burden of showing that the decision appealed from is in error. If an appeal is taken, your notice of appeal must be filed within 30 days from the publication of the Notice of Availability of the ROD in the Federal Register at the following address:

Utah State Director
Bureau of Land Management
324 South State Street, Suite 301
P.O. Box 45155
Salt Lake City, Utah 84145-0155

If you wish to file a petition pursuant to regulation 43 CFR 4.21 (58 FR 4939, January 19, 1993) for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay must also be submitted to each party named in the appeal and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

(1) The relative harm to the parties if the stay is granted or denied,

(2) The likelihood of the appellant's success on the merits,

(3) The likelihood of immediate and irreparable harm if the stay is not granted, and

(4) Whether the public interest favors granting the stay.

If you need any additional information regarding the EIS, please contact Lynn Jackson, Project Manager, or myself at (801) 259-6111. We appreciate your interest in the management of the public lands.

Sincerely,

Kate Kitchell
District Manager

2 Enclosures
1. ROD, Lisbon Valley Copper Project (30 pp)
2. Form 1842-1 (1p)

Form 1842–1
(February 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

INFORMATION ON TAKING APPEALS TO THE BOARD OF LAND APPEALS

DO NOT APPEAL UNLESS

1. This decision is adverse to you,
AND
2. You believe it is incorrect

IF YOU APPEAL, THE FOLLOWING PROCEDURES MUST BE FOLLOWED

1. NOTICE OF APPEAL . . . . Within 30 days file a *Notice of Appeal* in the office which issued this decision (see 43 CFR Secs. 4.411 and 4.413). You may state your reasons for appealing, if you desire.

2. WHERE TO FILE NOTICE OF APPEAL . . .

Utah State Director
Bureau of Land Management
324 South State Street, Suite 301
P.O. Box 45155
Salt Lake City, Utah 84145-0155

SOLICITOR ALSO COPY TO . . . .

Regional Solicitor, Intermountain Region
U.S. Department of Interior
6201 Federal Building
125 South State Street
Salt Lake City, Utah 84138-1180

3. STATEMENT OF REASONS . . Within 30 days after filing the *Notice of Appeal*, file a complete statement of the reasons why you are appealing. This must be filed with the United States Department of the Interior. Office of the Secretary, Board of Land Appeals, 4015 Wilson Blvd., Arlington, Virginia 22203 (see 43 CFR Sec. 4.412 and 4.413). If you fully stated your reasons for appealing when filing the *Notice of Appeal*, no additional statement is necessary.

SOLICITOR ALSO COPY TO . . . .

Regional Solicitor, Intermountain Region
U.S. Department of Interior
6201 Federal Building
125 South State Street
Salt Lake City, Utah 84138-1180

4. ADVERSE PARTIES . . . . Within 15 days after each document is filed, each adverse party named in the decision and the Regional Solicitor or Field Solicitor having jurisdiction over the State in which the appeal arose must be served with a copy of: (a) the *Notice of Appeal*, (b) the Statement of Reasons, and (c) any other documents filed (see 43 CFR Sec. 4.413). Service will be made upon the Associate Solicitor, Division of Energy and Resources, Washington, D.C. 20240, instead of the Field or Regional Solicitor when appeals are taken from decisions of the Director (WO–100).

5. PROOF OF SERVICE . . . . Within 15 days after any document is served on an adverse party, file proof of that service with the United States Department of the Interior, Office of the Secretary, Board of Land Appeals, 4015 Wilson Blvd., Arlington, Virginia 22203. This may consist of a certified or registered mail "Return Receipt Card" signed by the adverse party (see 43 CFR Sec. 4.401(c)(2)).

Unless these procedures are followed your appeal will be subject to dismissal (see 43 CFR Sec. 4.402). Be certain that all communications are identified by serial number of the case being appealed.

NOTE: *A document is not filed until it is actually received in the proper office (see 43 CFR Sec. 4.401(a))*

SUBPART 1821.2--OFFICE HOURS; TIME AND PLACE FOR FILING

Sec. 1821.2-1 *Office hours of State Offices.* (a) State Offices and the Washington Office of the Bureau of Land Management are open to the public for the filing of documents and inspection of records during the hours specified in this paragraph on Monday through Friday of each week, with the exception of those days where the office may be closed because of a national holiday or Presidential or other administrative order. The hours during which the State Offices and the Washington Office are open to the public for the filing of documents and inspection of records are from 10 a.m. to 4 p.m., standard time or daylight saving time, whichever is in effect at the city in which each office is located.

Sec. 1821.2-2(d) Any document required or permitted to be filed under the regulations of this chapter, which is received in the State Office or the Washington Office, either in the mail or by personal delivery when the office is not open to the public shall be deemed to be filed as of the day and hour the office next opens to the public.

(e) Any document required by law, regulation, or decision to be filed within a stated period, the last day of which falls on a day the State Office or the Washington Office is officially closed, shall be deemed to be timely filed if it is received in the appropriate office on the next day the office is open to the public.

* * * * *

*U.S. GPO: 1991-573-018/46019

M/037/088
DOGM RECEIVED
~ APRIL 2, 1997

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Record of Decision
Environmental Impact Statement
Lisbon Valley Copper Project

March 26, 1997

Prepared by:
U.S. Department of the Interior
Bureau of Land Management
Moab Field Office
Moab, Utah

Utah State Director
Bureau of Land Management

RECORD OF DECISION
ENVIRONMENTAL IMPACT STATEMENT
LISBON VALLEY COPPER PROJECT

TABLE OF CONTENTS

RECORD OF DECISION
ENVIRONMENTAL IMPACT STATEMENT
LISBON VALLEY COPPER PROJECT

I. SUMMARY

This Record of Decision (ROD) documents the decision approving the Plan of Operations submitted to the Bureau of Land Management (BLM) by Summo USA Corporation (Summo) on August 8, 1995. Summo's Plan of Operations proposed to construct and develop an open pit copper mine, heap leach facility and copper recovery plant, in Lisbon Valley, Utah. The project site is located 18 miles southeast of LaSal, Utah in San Juan County.

Environmental impacts from Summo's proposed action were considered and analyzed in a Draft Environmental Impact Statement (DEIS), prepared and released for public review and comment in May 1996. Based on comments received on the DEIS, modifications and revisions were made, and a Final Environmental Impact Statement (FEIS) was released for review in February 1997.

This Record of Decision summarizes the project and associated impacts; the alternatives analyzed, the alternatives considered and eliminated, and the environmentally preferred alternative; the rationale for adopting the decision; mitigation and monitoring requirements; and results of the public participation and the issues identified during this analysis process. Details of the proposal, alternatives, impacts, and mitigation and monitoring requirements are contained in the FEIS prepared for the proposal.

The EIS prepared for this project has been reviewed and analyzed by other federal agencies, state agencies, local governmental entities, private organizations, and individuals. Comments and issues raised in this process have been addressed or clarified through additional studies and analysis of existing data.

The decision to approve the mining operation incorporates all practicable methods to reduce environmental harm and minimize environmental consequences, while allowing for the development and production of the copper resource from this location.

II. PROPOSED ACTION

The proposed mining and recovery operation would be located on 574 acres of federal mining claims controlled by Summo on public lands administered by BLM. The project would also encompasses 273 acres of state lands, and 256 acres of private lands owned by Summo. The overall operation would involve 1,103 acres.

Conventional open pit mining techniques would be combined with heap leaching and solvent extraction-electrowinning processing to produce high quality copper for consumption.

Four open pits would be excavated, with the overburden and waste rock disposed of in four waste dumps, holding a total of 97.1 million tons of material. A 45 million ton heap leach pad would be constructed to recover the copper concentrate after leaching the ore with low concentrations of sulfuric acid. The copper in the leached solutions would then collected and recovered on-site through an electrowinning facility, and a final 99.9% pure copper cathode product would be shipped from the facility.

The project proposes to mine 750 tons of ore per hour, to allow production of 17,000 tons of copper annually. Construction of the facility would take 10 months and require 80 workers. Once full production capacity is reached during mining operations, the project would employ up to 143 employees. Mining and production would occur for 10 years.

Final surface reclamation activities would take an additional 5 years. The pits would be left open at the end of mining. The waste dumps and heap leach pad would be reclaimed in place, and all facilities dismantled and removed.

III. ALTERNATIVES

A. Alternatives Considered

In addition to the Proposed Action, three alternatives were developed and analyzed for environmental impacts, in addition to a No Action alternative. These alternatives were identified during the scoping process, and were developed to provide additional mitigation for impacts associated with the proposed operation. The following discussion summarizes principal features of these alternative actions.

No Action Alternative: Under this alternative, development of the mine and processing facilities would not occur. Approximately 85 acres of historic mining disturbance would remain in its current condition and would slowly recover natural vegetation and drainage patterns over many years. However, the area would continue to pose a threat to public health and safety, due to the unsafe and unsecured conditions at two of the existing three pits on location, and the potential for long-term pollution from unreclaimed waste piles currently on-site. Current conditions and trends related to wildlife, watershed, hydrology, land uses, etc., would remain as they are.

Open Pit Backfilling Alternative: Under this alternative, the mine pits would be either partially or completely backfilled at the cessation of mining operations. Such action would substantially reduce visual impacts, would lessen the threat to long-term public health and safety from the 300-600 foot open pits, would return an additional 231 acres to post-mining uses for wildlife and livestock forage, and would reduce the size of the remaining waste dumps considerably. This alternative was also identified as a potential solution to eliminate impacts from any ponding of water in the post-mining pits that could pose a threat to water quality. This alternative would also render any future recovery of remaining lower grade copper resources unrecoverable, both from a technical and economic standpoint.

Facility Layout Alternative: Under this alternative, the proposed number of waste dumps would be reduced from four to three, by eliminating waste dump D. This would result in less disturbance to natural watershed flow down Lisbon Valley and through Lisbon Canyon. This would be important from a long-term post-mining standpoint, and eliminate the possibility of the breaching of waste dump D from erosion of the dump, as the natural flow patterns attempted to re-establish themselves. This alternative would also result in a reduction of 55 acres of disturbance from the project, and reduce visual impacts to a small degree.

Waste Rock Selective Handling Alternative: Under this alternative, potentially acid generating waste rock would be selectively placed within the waste dumps and encapsulated within waste rock that is acid neutralizing. The Plan of Operations submitted would have randomly placed this material into the waste dumps. This selective handling would greatly lessen the long-term potential for acid bearing leachates to emanate from the waste dumps and impact watersheds, vegetation and wildlife.

B. Alternatives Considered and Eliminated

Several additional alternatives were identified during the scoping period, intended to further mitigate potential environmental impacts. Upon additional review, these alternatives were eliminated from further analysis based technical, economic, or environmental reasons. A summary of these alternatives, and the rationale for elimination are as follows.

Underground Mining Alternative: This alternative would have eliminated the open pits. However, the disseminated copper ore body is not amenable, technically or economically, to underground mining methods, which leave a high percentage of the ore in the ground for roof support.

Site Access Alternative: An alternative was suggested that would move the county road away from the mine site, to lessen potential safety concerns to vehicle traffic utilizing the county road. This alternative was eliminated due the topography of Lisbon Valley at the mine site. In order to bypass the mine

site, the road would have to be constructed over steep terrain on the high ridges flanking the valley. This would have added significantly to surface disturbance associated with the project.

Processing Alternative: Alternatives to heap leaching recovery were analyzed to determine if other recovery methods could be utilized to reduce impacts. Other techniques include vat processing, conventional milling and off-site processing. Vat processing would result in significant increases in air emissions and costs. The ore is not chemically amenable to floatation processes required in conventional milling. Haulage costs for off-site processing would make the project uneconomical. Therefore this alternatives was eliminated.

Haulage Alternative: A system of conveyor belts was considered as an alternative to trucking ore from the pits to the leach pad, and waste rock to the waste dumps. This alternative was eliminated due to increased crushing that would be required prior to placing the ore or waste rock on the conveyor system, increasing costs and air emissions. Additionally, the conveyors would require routine moving as operations progressed from pit to pit and dump to dump, increasing costs and rendering the operation uneconomical.

Water Balance Alternative: The operational use of water for leaching will result in periods of water excess, during high precipitation periods. Summo plans to eliminate this water excess by spray irrigation on top of the leach pad. Concerns about off-site impacts from drift of leaching solutions (sulfuric acid) resulted in initial analysis of alternative methods to reduce excess water volume. Alternatives to spraying would be re-injection to the aquifers or increased storage ponds. Both methods would significantly add costs and surface disturbance to the project.

Powerline Route Alternative: Based on impacts from constructing a new powerline to the area, several alternatives were considered for the powerline. In addition to the route analyzed for the proposed action, three other routes were evaluated in addition to burial of the line, and use of an existing lower power line currently serving the abandoned mine site. None of these alternatives offered any environmental or economic advantages over the proposed action. All would either cost more, cross more rugged terrain, be longer, or require more surface disturbance, including upgrading of the existing line. Based on these factors, the alterative routes and/or upgrades were eliminated from further consideration.

C. Environmentally Preferred Alternative

The environmentally preferred alternative has been identified as the Proposed Action, as modified by the Facility Layout and Waste Rock Selective Handling Alternative. This combination of alternatives, combined with the identified mitigation and monitoring requirements, provides the greatest degree of environmental protection from impacts resulting from the project, while providing opportunity for Summo to develop the copper mineral resources at this location in accordance with their rights acquired under provisions of the 1872 Mining Law as amended.

IV. DECISION

It is the decision of the Utah State Director of the Bureau of Land Management to authorize Summo USA Corporation to proceed with development of the Lisbon Valley Copper project, as described in the FEIS, subject to modifications identified in the Facility Layout Alternative and the Waste Rock Selective Handling Alternative. The project as originally proposed, is further modified by the mitigation and monitoring requirements identified in this Record of Decision, which were developed from analysis of environmental impacts associated with the proposed action and alternatives.

It has been determined that the decision is in conformance with provisions of the Grand Resource and San Juan Resource Area, Resource Management Plans, for both the mine located on lands administered by BLM's Moab District office, and the associated powerline located on lands administered by the BLM's San Juan Resource Area.

Based on review of all components and impacts associated with the project, combined with identified mitigation and monitoring stipulations, it has been determined that the project will not result in unnecessary or undue degradation of public lands, as required under the Federal Land Policy and Management Act of 1976.

The Record of Decision and approval incorporates the recommended mitigation and monitoring as presented in the FEIS. The Record of Decision has attempted to present this mitigation in a clear, concise manner, and has subsequently made modifications and clarifications in wording from that presented in the FEIS.

The Decision to approve the Plan of Operations incorporates the following general features, conditions and requirements. Further details associated with mitigation and monitoring requirements are identified in the Mitigation and Monitoring section of this Record of Decision.

A. Mining Operations

Operation of the mine and processing facilities will allow the disturbance of 1,103 acres over the life of the mine.

Summo will utilize conventional open pit mining techniques to mine ore and waste rock at an average rate of 12,500 tons per day, from 4 open pits, over a projected mine life of 10 years. The 4 open pits will encompass 231 acres: the Centennial pit at 116 acres, the GTO pit at 68 acres, the Sentinel #1 pit at 38 acres, and the Sentinel #2 pit at 9 acres.

Mining of the Sentinel #1 pit will not be allowed to cross Lisbon Canyon, as proposed in the Plan of Operations, due to the extreme post-mining surface water flow and erosion impacts that would result from such action.

Surface water will not be diverted into the Sentinel #1 pit at the end of mining operations, as proposed in the Plan of Operations, also due to the extreme post-mining erosion this would result in throughout the Lisbon Valley drainage. All surface water will be allowed to flow unimpeded through Lisbon Canyon.

B. Waste Rock Dumps

In accordance with the Facility Layout Alternative identified in the FEIS, and subsequently incorporated into this approval, the overburden and waste ore will be contained in 3 waste dumps, encompassing 394 acres. Dump D, as identified in the Plan of Operations, will be eliminated, and it's contents will be distributed among the remaining three dumps.

In accordance with the Waste Rock Selective Handling Alternative identified in the FEIS, and subsequently incorporated into this approval, waste rock placed in the dumps will be handled in conformance with the Waste Rock Sampling Plan, incorporated as Attachment 2 in Appendix A in the FEIS, and subsequent modifications identified in the Mitigation and Monitoring section included in this Record of Decision.

All waste rock types will be tested and characterized during mining, and as-built waste dump maps will be prepared and maintained during the life of the mine for each waste dump. Copies of these maps will be provided to BLM and the State of Utah Division of Oil, Gas and Mining (UDOGM) on request, and final copies will be provided to these agencies at the end of mining operations.

C. Heap Leach Pad

A 266 acre heap leach pad will be constructed on site to leach the copper from the ore with a solution of dilute sulfuric acid. The leach pad will be designed to process 750 tons of ore per hour. The leach pad will be approximately 100 feet high, one mile in length and 1/2 mile in width, and will be constructed in four stages.

Lining of the heap leach pad will be as identified in the Plan of Operations, and subsequently modified in the Utah Division of Water Quality (UDWQ) Groundwater Quality Discharge Permit (GWQDP, FEIS Appendix D). Summo will provide UDWQ and BLM copies of their Quality Control/Quality Assurance Plan for construction, testing and inspection of the liner, 30 days prior to initiation of liner construction activities.

Final rinsing and closure of the leach pad will be in conformance with requirements established by the UDWQ/GWQDP (FEIS Appendix D), in consultation with BLM and UDOGM. Appropriate pre-closure testing will be conducted on the spent heap leach ore, to assure final pH levels are neutralized prior to final capping and reclamation of the leach pad.

D. Processing Facilities

Facilities will be constructed to allow solvent extraction-electrowinning processing to be used to separate the copper from the extracted leach solution. These facilities will be as constructed and built as identified in the approved Plan of Operations.

Solution ponds associated with the recovery facilities will be constructed as identified in the Plan of Operations, and as modified by the UDWQ/GWQDP (FEIS Appendix D).

Processing of the ore and mine dust control operations will consume an average of 907 acre feet of water per year during the life of the mine, to provide process water requirements of up to 1,000 gallons per minute. This water will all be consumed on-site with no discharge to the surrounding environment. Water for the project will come from pit dewatering and on-site wells that will draw water from the various confined aquifers below the project site.

E. Powerline Right of Way

Electrical power for the operation will be supplied by a 69kV powerline provided by PacifiCorp from the existing Hatch substation west of the project area. The route will be 10.8 miles long, of which approximately one half the distance is along previously existing powerline rights-of-way.

The right-of-way application for the powerline is approved with this Record of Decision. All conditions of the Plan of Development submitted with the right-of way application for the powerline will be adhered to unless otherwise modified by this decision.

F. Reclamation

The mine pits will be allowed to remain open upon completion of mining operations. A 3 foot berm will be constructed around all pits within 50 feet of the pit edge, designed to drain surface runoff away from the pits and discourage use. A three strand bard-wire fence will also be constructed around each pit adjacent to the outside edge of the berm. The fence will be posted, warning the public of the potential hazard.

At the completion of mining, waste dumps will be reclaimed in place by grading them to approved slopes, covering them with appropriate soils, and reseeding in accordance with the Monitoring and Mitigation requirements identified in this decision. Final seed species may be modified by the BLM Authorized Officer, based on results of test plot data obtained during the life of the mining operation.

The heap leach pad will remain in place upon completion of mining operations. The pad will be rinsed, neutralized, capped, and reseeded to meet standards identified in the Mitigation and Monitoring section of this decision, and requirements of the second 5 year UDWQ/GWQDP permit.

At the completion of mining operations, all facilities will be dismantled and removed from the location. In addition, all equipment, supplies and categorized hazardous wastes will be removed. Facility sites will be regraded and reseeded in accordance with provisions identified in the Plan of Operations, and as modified in the Mitigation and Monitoring section of this Record of Decision.

All other reclamation requirements will be as identified in the Plan of Operations, and as modified in the Mitigation and Monitoring section of this Record of Decision.

G. Bonding

Initial Mining Reclamation Bond

Prior to initiation of on-the-ground operations, Summo will be required to post reclamation

bonding in accordance with directions and requirements of UDOGM and BLM. The bond will cover operations on all lands associated with the mining and recovery operation. The total amount of this bond has been determined to be $8.6 million dollars. The bond will be available at any time to BLM and state agencies in the event of default by Summo on obligations and requirements included as part of this approval.

As approved by the Utah Board of Oil, Gas and Mining and BLM, this bond will be posted incrementally, based on the yearly projection of total surface disturbance, such that bonding is sufficient to allow reclamation of the disturbance on the ground at ant given time. The initial payment will be $2.6 million dollars.

Release of the initial reclamation bond will be based on completion of successful surface reclamation and leach pad closure after operations have ceased. It is anticipated that this will occur no sooner than 5 years after mining and reclamation activities are completed. Release will be determined by concurrence of BLM, UDOGM and UDWQ.

Long-Term Reclamation Bond

In addition to the initial mining reclamation bond, a second long-term reclamation bond will be required of Summo. This bond will be posted to provide financial assurance for monitoring, and if necessary, potential long-term impacts to groundwater resulting from water that may develop in the post-mining pit lakes. This bond will be available for any necessary reclamation that may be required to remediate unacceptable water resource impacts resulting from these potential pit lakes.

The timeframe for initiation of this bond and the amount of the bond will be determined by BLM, based on an annual evaluation, assessment and characterization of hydrologic and geochemical data, collected in accordance with provisions of this approval and the UDWQ/GWQDP. Requirements for collection and characterization of the data and reports are outlined in detail under Section VI, Hydrology and Geochemistry mitigation and monitoring.

The initially required classification of the Entrada/Navajo aquifer, and the annual assessment of hydrologic and geochemical data identified in the Mitigation and Monitoring section of this approval, will be the key components in determining at what the point this bond may be required. The data collected will be modeled and analyzed on a yearly basis until such point as definitive projections can be made as to the projects potential long-term impact on water quality of the various confined aquifers beneath the project site. If at any point during the initial 5 year annual review and characterization analysis it appears the water quality impacts will be unacceptable, the company will be required to post the appropriate bond to provide assurance of long-term financial resources to allow long-term monitoring and remediation of potential impacts.

As long as assessment of this data indicates projected impacts are within parameters determined by UDWQ, the requirement for bonding will be held in abeyance. However, if at the end of the 5 year annual assessment period, data are still inconclusive regarding potential groundwater impacts, bonding and continued annual assessments will be required.

Once a determination is made to post the bond, Summo will be required to provide interest bearing securities sufficient to take appropriate action to remediate projected unacceptable impacts. The posting of this bond will occur within 30 days of written notification by BLM. If Summo fails to file this bond within the prescribed timeframe, they will be served a notice of noncompliance. The notice of noncompliance will require that Summo post financial guarantee within an additional 90 days. Failure to submit the requested financial guarantee will subject Summo to penalties identified under 43 CFR 3809.

The amount of the bond will be based on monitoring, projected impacts and associated costs to remediate those impacts. Summo will be given the opportunity at that time to initiate measures to reduce or eliminate long-term projected impacts, and/or to provide input to BLM in developing remediation methods and cost estimates. BLM will be responsible for the final determination of bonding amounts.

The initial term of the long-term reclamation bond will be up to 25 years following cessation of mining operations. Cessation of mining operations will be determined to have occurred when the BLM is notified in writing of such by Summo, or if mining operations do not occur for a period of 12 successive months. Re-initiation of mining operations after any idle period, will result in re-establishment of the 25 year period at the cessation of any subsequent operations.

Release of the long-term reclamation bond will be based on results of the monitoring program and remediation efforts identified by BLM, in consultation with UDWQ. This bond may be released prior to the initial 25 year term if monitoring and modeling conclusively indicates that no current or potential trends for unacceptable long-term impacts to surface or groundwater is occurring from the mining operation. If monitoring indicates a trend of degrading surface or groundwater quality, that could reasonably be expected to result in impacts beyond the initial 25 year bonding period, the bond will be retained, the term extended, and continued monitoring will be required until it can be demonstrated that no additional impacts will occur.

H. Mitigation and Monitoring

All mitigation and monitoring measures identified in Summo's Plan of Operations and Mitigation and Monitoring Plan (FEIS Appendix A), as supplemented and modified by the Mitigation and Monitoring requirements cited herein, are hereby incorporated into the Record of Decision and will be adhered to by Summo. All subcontractors operating on this project will also be required to fully adhere to all applicable requirements relating to this approval.

Summo will be required to drill six monitoring wells into the Entrada/Navajo aquifer. These will consist of two wells downgradient of each of the three pits that have been forecasted to form pit lakes. The first well will be drilled and completed within 3 months of initiation of site construction activities. This well will be drilled downgradient of the Sentinel pit, to begin providing data pertinent to classification of the Entrada/Navajo aquifer. This well may not be used as a water supply well, unless written approval is obtained from UDWQ.

The second Sentinel pit monitoring well, the two Centennial pit monitoring wells, and the two GTO pit monitoring wells will be drilled prior to initiation of mining operations at the respective pits (with mining defined as the initiation of overburden removal). These wells will provide baseline aquifer data prior to initiation of mining activities, and allow monitoring to assure long-term water quality degradation does not exceed parameters as determined and set by the UDWQ. Location and design of these wells will be done in consultation with BLM and UDWQ. Additional details associated with these wells are identified in Section VI, Hydrology.

BLM will be allowed full and complete access to all data and test results associated with the monitoring and mitigation requirements upon request. This will include inspection of all relevant test locations, equipment, data, and model interpretations.

I. Additional Operations or Operators

Any proposed changes in mining or recovery operations or methods that will involve additional surface disturbance or impacts beyond those identified in the Plan of Operations, and analyzed in the FEIS, will require prior application, review and written approval by the Authorized Officer of BLM, and any necessary state or local agencies with appropriate jurisdiction over the proposal.

Such review and approval may require additional environmental analysis under provisions of the National Environmental Policy Act. BLM will be solely responsible for determining when such additional activities exceed the scope of the FEIS and subsequent approvals and analysis are necessary. Failure of the operator to obtain such approvals prior to initiating additional unauthorized activities will be grounds for noncompliance actions.

Summo will submit plats to BLM of any modified facility layouts, designs or locations of stockpiles and other facilities previously identified in the plans and figures presented in the FEIS.

Any changes in operator(s) must be approved in writing by BLM and UDOGM. All outstanding reclamation liability, monitoring and bonding requirements must be acknowledged by the new operator(s) in writing. Once the reclamation liability is acknowledged and the replacement bond is in place, Summo will be released of their reclamation and bonding liabilities.

Requirements for compliance will remain in effect until Summo has been formally released of such obligation, in writing, by the BLM and/or appropriate state or local agencies.

In the event of contradictions or confusion between requirements identified in Summo's Plan of Operations and Mitigation and Monitoring Plan (FEIS Appendix A), and the requirements and conditions as set forth in this Record of Decision, the Record of Decision will supersede.

V. MANAGEMENT CONSIDERATIONS

A. FEDERAL LAWS

Summo's mining and recovery operation is approved under authority of the General Mining Law of 1872 as amended, and the Federal Land Policy and Management Act of 1976 (FLPMA). These laws, and the regulations formulated to implement them, identify mineral development as an appropriate multiple use of public lands.

Policy identified in 43 CFR, Part 3809.0-6, summarizes the rights conveyed under the General Mining Law of 1872 as amended and modified by FLPMA:

> "Under the mining laws, a person has a statutory right, consistent with Departmental regulations, to go upon the open (unappropriated and unreserved) Federal lands for the purpose of mineral prospecting, exploration, development, extraction, and other reasonable uses incident thereto. This statutory right carries with it the responsibility to assure that operations include adequate and reasonable measures to prevent unnecessary and undue degradation of the Federal lands and to provide for reasonable reclamation."

Within the context of this statutory authority, rights granted under the Mining Law are modified to varying extent by requirements imposed by other laws. Such laws include the National Historic Preservation Act of 1966, the Threatened and Endangered Species Act of 1973, the Clean Water Act of 1977, and the American Indian Religious Freedom Act of 1978. Mining operations proposed under the 1872 Mining Law must comply with provisions of these statutes and implementing regulations and/or Executive Orders.

Various federal and state agencies are involved with enforcement of these statutes, such that a proposal on public lands for a mining and recovery operation of this type and magnitude must comply with provisions of these other Acts and appropriate state statutes. The process of identifying environmental impacts, and ensuring compliance with these other statutes, is analyzed in the implementation of the National Environmental Policy Act (NEPA) of 1969. For Summo's proposal, NEPA was complied with by the preparation of an Environmental Impact Statement (EIS). This Record of Decision identifies the decisions made as a result of the analysis identified in the EIS process.

B. CRITICAL ELEMENTS

According to guidelines identified by BLM NEPA Manual Guidance, H-1790-1, the following elements are subject to requirements specified in statute, regulation, or executive order and must be considered in all EIS's. If the elements are not present or at issue with the proposal, a negative declaration is documented. The following list provides this evaluation by critical element:

<u>Critical Elements Not Affected</u>:

Areas of Critical Environmental Concern (ACEC's)
Prime or unique farmlands
Floodplains, wetlands and riparian areas
Wild and scenic rivers
Wilderness

Critical Elements Considered in the FEIS:

Air Quality
Threatened or endangered plants
Threatened or endangered animals
Water resources
Cultural or historic resources
Native American concerns
Paleontological resources
Visual resources
Hazardous wastes

C. ENVIRONMENTAL IMPACTS

Geological and Geotechnical

The impacts to geologic resources are principally the mining and utilization of the copper resource. There were no impact specific issues related to utilization of this resource. Additionally, under rights granted by the 1872 Mining Law, Summo as claimant, has the statutory right to develop this resource.

The primary geotechnical issues dealt with in the analysis were impacts from slope failures on the waste dumps and leach pad associated with static loading or seismic events, failure of liner systems under the leach pad and solution ponds, exceedance of solution pond capacities during storm events, and foundation settling of facilities, particularly the leach pad.

Review of design parameters developed and submitted by the company and various sub-contractors, based on projected static loads and seismic parameters, in addition to various mitigation measures identified through the EIS analysis, there is minimal potential for environmental impacts from slope failures, liner failure, foundation settling, or pond overflow.

The dumps and leach pad have been designed to contain slope failures within bermed and/or lined areas, eliminating potential for impacts associated with such failures. The ponds have been designed to provide excess fluid capacity under wet conditions, and the liner systems for the leach pad and ponds have been designed and engineered to prevent failure and foundation settling. The ponds and leach pad will be underlain by leak detection systems, and the ponds will be underlain by a leak collection system. Additionally, downgradient monitoring wells will be installed to identify potential leakage from the leach pad and/or solution ponds.

Additional geotechnical issues relate to the topographic changes associated with the mining operation. At the end of mining, the pits will be left open and there will be four new waste piles left on the surface, consisting of three waste dumps and the heap leach pad. The dumps and leach pad will contain 97.8 million cubic yards of material on 660 acres of land. The estimated dimensions of each of these features is as follows:

Pit	Acres	Depth	Length	Width
Centennial	116	380'	3200'	1800'
GTO	68	610'	3000'	1200'
Sentinel 1	38	500'	1500'	800'
Sentinel 2	9	140'	600'	500'

Dumps/ Pad	Acres	Height	Length	Width	Volume
A	186	320'	3300'	3200'	22.5 *
B	90	300'	3300'	2000'	21.5
C	118	320'	3000'	1800'	21.0
Pad	266	105'	5400'	2400'	32.8

* Millions of cubic yards

The final decision selects the Facility Layout Alternative, which requires the elimination of Waste Dump D. The material will be added to the three remaining waste dumps. This will eliminate some topographic impact, although Waste Dump D was the smallest of the four proposed waste dumps at 55 acres, and the remaining three dumps will be higher. The primary reason for eliminating this dump was its proposed location in the bottom of a drainage, and concern with long-term impact from post-mining erosion in this drainage, with the potential to eventually undermine and erode the dump into downstream surface drainages.

Another specific alternative was developed in the EIS to analyze impacts from backfilling the open pits, either completely or partially. This would have reduced impacts to topography through reducing the size of the waste dumps and filling the open pits. The analysis indicated

positive impacts from a complete backfill to visual resources, more area returned to vegetative cover, and enhanced public safety.

A second backfilling scenario was developed within this alternative to analyze impacts from a partial backfill of the pits. This scenario would provide sufficient backfill to cover any potential post-mining pit lakes to prevent evapoconcentration of metals and potential groundwater quality degradation in adjacent and lower aquifers. Such a scenario would have less positive benefit from visual reduction or long-term vegetative enhancement because the pits would be only partially backfilled, and portions of the waste dumps would remain.

The Backfill Alternative was not selected for several reasons identified in the following discussion:

1- The analysis indicates under both backfill scenarios, that there would be water quality impacts from backfilling the pits with material from the waste dumps, due to the chemical makeup of the waste rock backfill material, particularly the acid generating material. With the tremendous increase in surface area exposed in the rubblized backfill material, chemical reactions between this material and the groundwater could present a host of unquantifiable adverse impacts to the downgradient aquifers, resulting from chemical interactions of groundwater and the waste rock.

2- A secondary problem associated with backfilling is the decision to select the Waste Rock Selective Handling Alternative to mitigate potential for post-mining acid rock drainage. Under this alternative, the acid generating waste rock mined from the pits will be selectively placed in the waste dumps to encapsulate the acid generating material within acid neutralizing material. The intent is to encapsulate this material such that there will be no long-term acid leachates emanating from the waste dumps. By requiring a backfill of material from the waste dumps into the pits, the engineered placement and isolation of acid generating material in the dumps would be jeopardized and foregone.

3- From the standpoint of visual impact reduction, the analysis indicates that even with backfilling, there will still be surface dumps present because of the swell factor of rock once it is taken from the ground and rubblized, i.e., it would not all fit back into the pits. Additionally, the analysis indicates the area has a visual rating of Class IV, the lowest rating under BLM's Visual Classification Rating system, indicating visual impacts at this location are not critical.

4- With post-mining pit berming, fencing and signing, public safety issues will be minimized. The analysis indicated no known instances of public safety problems associated with the unbermed, unfenced and unsigned pits that have existed on the site for the past 20 years.

5- Not requiring backfilling of the pits also involves a conservation of resources issue. Requiring the pits to be backfilled will render future recovery of lower grade copper ore remaining in the pits at the end of mining infeasible from an economic standpoint. Summo will mine copper reserves to an "economic limit", determined by mining costs, grade of copper and the price of copper. However, when they have reached this limit, there will still likely be lower grade copper ore remaining in the pits. It's grade would be uneconomical for recovery by Summo at prices and technology projected at that time.

As the recent advent of heap leaching technology has demonstrated, previously uneconomical copper resources are now economically recoverable. There may be a point in the future where additional advances in technology, or price increases occur, warranting recovery of yet lower grade copper reserves. If the pits were backfilled at the end of Summo's mining operation, the increased costs of removing this material to gain access to the lower grade copper, would add economic costs to such a project, rendering it infeasible, and recovery of any remaining copper resources would most be lost.

Hydrology

Issues addressed in the EIS process regarding hydrology were numerous and are discussed in detail under the underlined headings in this section. Hydrologic issues are clearly the primary issue with the greatest potential for impact from the project.

However, based on hydrogeologic conditions at the location of the project site, prediction of these impacts is complex and uncertain. This is a result of the highly faulted, compartmentalized nature of the aquifers present, making computer modeling of behavior and impacts tenuous at best.

Groundwater Quality

The most probable long-term impact to groundwater quality in the project vicinity will occur from potential lakes forming in the open pits after cessation of mining. These impacts could consist of degradation of groundwater quality, caused primarily by impacts from the lakes containing high concentrations of evapoconcentrated metal oxyanions (antimony, arsenic, cadmium, copper, molybdenum, selenium, uranium, and zinc), high TDS and high pH levels.

Based on additional data acquired as a result of public comment on the Draft EIS, the hydrologic characteristics of the project area were re-modeled. Data derived from one additional groundwater well, indicated a higher vertical hydrologic head between the upper and lower aquifers (Burro Canyon and Entrada/Navajo aquifers respectively), the result of a zone of 400 feet of unsaturated strata between the two aquifers (the Morrison Formation).

The results of this re-modeling indicate that water will accumulate to less depth in the post-mining pits than originally indicated in the Draft EIS. Additionally, the new modeling also indicates that pit water will potentially drain vertically from the pits, as well as horizontally into adjacent groundwater units. Such flow characteristics could decrease the potential impacts to pit lake water quality from evapoconcentration of metals and Total Dissolved Solids (TDS), because pit lake water that drained regularly to lower formations would not evapoconcentrate metals or TDS.

However, the vertical drainage model subsequently indicated increased potential to impact the underlying Entrada/Navajo aquifer, from water in the pits above filtrating downward into them. Additionally, at the completion of mining, the Entrada/Navajo aquifer will be much closer to the surface of the bottom of the pits, and in fact the Entrada Formation will be exposed in the western wall of the Centennial Pit. What can't be determined conclusively at this time is what these impacts will be.

Test data from the Burro Canyon aquifer indicates high levels of metals and radionuclides in the Burro Canyon, such that UDWQ has classified this water as a Class III water, not suitable for consumption without treatment. Classification of water in the Entrada/Navajo aquifer has yet to be determined. Initial indications are that it is also a Class III aquifer, however test results are suspect.

Two wells have been drilled into the Entrada/Navajo aquifer. The first well, drilled in June 1995, allowed a large quantity of water in the upper Burro Canyon aquifer to move downhole and co-mingle with Entrada/Navajo aquifer waters, before a test of the Entrada/Navajo could be conducted. As a result, the Entrada/Navajo was not tested in this well, and it was plugged back to the Burro Canyon.

Based on concerns identified during the DEIS comment period, Summo was directed to drill an additional well into the Entrada/Navajo to better determine water quality characteristics. The second well, drilled in September 1996, was located only 75 feet downgradient of the first well. Test data from the Entrada/Navajo in this well showed levels of radionuclides similar to that of the Burro Canyon, but otherwise better quality water. Due to the close proximity to the first well, the water tested from the Entrada/Navajo in the second well could have been contaminated from the water infiltrating from the Burro Canyon aquifer in the first well.

It is also possible, that contamination did not occur, and the high radionuclide concentration

is naturally occurring in the Entrada/Navajo aquifer. This is suggested by a comparison of key mineral components tested in both the Burro Canyon and the Entrada/Navajo aquifers from the second well. This comparison shows marked dissimilarities, indicating different water sources, and subsequently no effect from the co-mingling of the aquifers in the first well. If these levels of radionuclides are natural, it would suggest a UDWQ Class III aquifer determination for the Entrada/Navajo aquifer at some point in the future.

The inconclusive results from testing to date suggest several scenario's for possible impacts to the Entrada/Navajo aquifer as follows:

1- The first scenario assumes that water in the Entrada/Navajo aquifer is Class III. As water develops in the post-mining pit lakes, the pit water stays similar in quality to that of the infilling Burro Canyon water, infiltrates horizontally into the adjacent downgradient Burro Canyon aquifer and downward into the Entrada/Navajo aquifer at rates which diminish evapoconcentration of metal oxyanions in the bottom of the pits. Since all water qualities would remain essentially the same, no adverse impact would be expected to any of the adjacent or lower aquifers.

2- The second scenario also assumes the Entrada/Navajo aquifer is Class III. Water developing in the pit lakes does not drain vertically or horizontally at sufficient rates to eliminate evapoconcentrated metal oxyanions, but infiltrates downward into the Entrada/Navajo aquifer, horizontally into the adjacent downgradient Burro Canyon aquifer, and further degrades already poor quality aquifers. This may not be problematic in the long-term, as Class III aquifers are by definition not useable without treatment, and are subsequently allowed to be subject to further degradation within parameters set by the UDWQ.

3- A third scenario assumes the water in the Entrada/Navajo aquifer may be found to be higher quality than Class III. As water from the Class III Burro Canyon aquifer develops in the pit lakes, whether containing evapoconcentrated metal oxyanions or not, it infiltrates downward into the Entrada/Navajo aquifer, and results in degradation of a higher quality aquifer, exceeding allowable parameters as determined by the UDWQ.

An additional concern related to water quality issues involves potential impact to the Dolores River from the mining operation and subsequent disruption of the aquifers at the project site. The Lisbon Valley aquifers all flow downgradient to the Dolores River, approximately 10 miles southeast of the project site. There is potential for long-term impacts to the Dolores River from degraded pit lake water quality entering the aquifer flow system and eventually making its way to the Dolores River.

However, the analysis indicates minimal potential for water quality degradation of the Dolores River, due to the distance and the dilution factor of water traveling over that distance. Additionally, the requirement for aquifer monitoring wells immediately downgradient of the abandoned pits will allow early detection of such potential impact.

In summary, data available at this time does not allow definitive projections of potential groundwater quality impacts. The worst case indications are that the project could result in long-term adverse impacts to groundwater resources in the project area. To acquire sufficient data to allow accurate predictive modeling would require many wells with several years of monitoring, and several years of extensive geochemical testing and modeling of aquifer waters and pit wall rock.

In lieu of having this data at this time, provisions are made and incorporated as a condition of this approval, that require collection of necessary data, annual characterization modeling and analysis, and provisions for long-term monitoring and reclamation bonding in the event this additional characterization data indicates potential of unacceptable long-term impacts.

In conclusion, Summo will be required to protect groundwater resources to the levels of protection required by the UDWQ/GWQDP, under authority and primacy granted to the State of Utah under provisions of the Clean Water Act. The fact that the aquifers in the

area are or may be of a naturally degraded quality, and isolated from regional aquifers as indicated in the FEIS analysis, may limit the degree of protection required, and the degree to which impacts are determined acceptable under provisions of the law.

Groundwater Dewatering

The analysis indicates groundwater depletion will occur as a result of water used for mining operations. Estimates indicate up to 22% of the shallow Burro Canyon aquifer water supply will be depleted and up to 6% of the deeper Entrada/Navajo aquifer at this location. This use will lower the water tables.

After mining ceases, the groundwater will slowly recharge over many years. However, because of the existence of the remaining open pits, which intersect the upper aquifer, the levels of water in the upper aquifer will never return to the levels existing prior to mining. Estimates indicate levels will be permanently lowered by 60 to 100 feet. Since a smaller percentage of the water available in the Entrada/Navajo aquifer will be utilized, long-term lowering of the deeper water table is not anticipated. Post-mining recharge will bring levels back up to current elevations. However, use of this deeper aquifer is projected to diminish subsurface flows to the Dolores River system, approximately 10 miles downgradient of the mining operation. The effect of this diversion is temporary, and expected to be less than 1% during mining and .02% after mining.

These impacts are determined to be relatively minor in the long-term, and the impacts are tempered by the hydrologic and geologic isolation of the aquifer from regional aquifers, the current lack of use of this water, the projected lack of future use, and the current water quality.

Groundwater Impacts from Leaching and Processing Operations

An issue was identified regarding potential groundwater impacts from a potential leakage of liner systems underneath the heap leach pad and solution ponds. Based on the analysis, there appears to be minimal likelihood of impacts to groundwater from the leaching and processing operations. The engineered liner system under the leach pad and the solution ponds, combined with the depth to potential groundwater (over 400 feet beneath the leach pad), and the requirement for monitoring wells adjacent to and downgradient of the leach pad, provide sufficient control of process solutions such that any leaks would be detected early and could be remediated, and subsequently no environmental impact is anticipated.

Groundwater for Dust Control

An issue was identified relating to the high levels of radionuclides naturally occurring in the groundwater in the project area, and the use of this groundwater for dust suppression activities. Concerns were raised regarding potential health impacts to workers and to the environment.

Based on analysis presented in the FEIS, the low levels of the radioactive chemical constituents creating these radionuclides, combined with their low mobility, present no threat to human health or the environment. Summo will therefore be allowed to utilize this groundwater for dust control and copper processing operations.

Water Uses

Water use issues are primarily related to long-term availability and impacts to quality. Analysis indicates short-term loss of water resources and potential long-term impacts to water quality, both in the aquifers and the post-mining pit lakes. It has also been determined that water occurring in the post-mining pits may not be useable without treating.

These impacts are tempered by the hydrologic and geologic isolation of the aquifers at the project site. They are not connected to regional aquifers due to the faulting on either side of Lisbon Valley. Additionally, the poor quality of water occurring in the area and the isolated nature of the area, such that no current use is occurring and no long-term use is anticipated, also temper concern with potential impact.

Water Supply Near Summit Point

The area south of the proposed project site, in the Summit Point and Three Step Hill area, contains private land which may at some point be utilized for remote residential housing. Subsequently, one of the issues identified was the potential impact of the project on future water supply for these residents.

Again, the analysis indicates geologic and hydrologic characteristics of Lisbon Valley result in relative isolation of the aquifers. The source of water for existing water wells in the Summit Point area is the Burro Canyon aquifer, which has no hydrologic connection to the Burro Canyon aquifer in Lisbon Valley. Additionally, the Entrada/Navajo aquifer underlying the Three Step Hill area is 300-400 feet higher in elevation than the same aquifer in Lisbon Valley due to the downfaulting in Lisbon Valley.

The analysis subsequently determined that the mining operation will have no impact on future water supply or quality for potential residents south of the project site.

Increases in Erosion and Sedimentation

Disruption of natural surface water flow can lead to increases in sedimentation and erosion, which was identified as an issue. Based on an assessment of impacts, combined with identified mitigation, it has been determined that the operation will pose no long-term impact to erosion and sedimentation. Short-term impacts will be disruption of natural flow paths, and initial sedimentation from construction and preparation of the mine site. In the long-term, sediment control features and diversions will mitigate this impact.

Additionally, Summo's proposal to mine across the mouth of Lisbon Canyon at the Sentinel Pit, and to divert post-mining drainage into the pit is not approved. A review of Summo's plan indicated minimal reserves crossing over the mouth of the canyon. When compared to the potential for serious long-term drainage disruption, the problems and costs with designing long-term diversion structures, and the potential erosion and up valley headcutting that would be caused by diverting post-mining drainage into the Sentinel Pit, the impacts from extending the mine across the canyon mouth are not justified.

Geochemistry

Another primary issue associated with the mining proposal are geochemical impacts. The major concerns are related to potential groundwater degradation from potential geochemical constituents in the post-mining pit lakes, as cited in the previous section, and concerns related to potential long-term impacts associated with acid rock drainage from the waste dumps and heap leach pad. Many of the geochemical concerns are closely associated with water quality, as identified under the Hydrology section.

Pit Lake Geochemistry

Geochemical concerns with potential long-term aquifer degradation associated with the post-mining pit lakes will be subject to the same types of short and long-term testing and additional modeling as identified in the previous Hydrology section. Long-term testing of post-mining pit lake water and downgradient aquifer monitoring wells will be required, and long-term reclamation bonding may be posted for a period of up to 25 years post-closure, in the event additional characterization modeling indicates unacceptable long-term impacts.

Acid Rock Drainage

With the decision to select the Selective Waste Rock Handling alternative identified in the FEIS, potential impacts from acid rock drainage from the waste dumps have been mitigated. This alternative will require selective encapsulation of the estimated 10% of waste rock that is acid generating, within layers of waste rock which have been shown to be acid neutralizing.

During the life of the mine, mitigation requirements will result in the continued testing of geochemical properties of the waste rock, and the preparation of waste dump maps that will depict where the exact location of the acid generating material is within the waste dumps.

A monitoring program of surface soil sampling below the waste dumps, combined with groundwater monitoring wells, will provide back-up confirmation of the effectiveness of these measures, and will identify the need for remedial action in the event impacts are detected.

Heap Leach Pad

Upon cessation of recovery operations from the pad, the spent ore will be rinsed with water and tested to assure pH levels are brought to neutral ranges. If needed, chemical additives, (primarily calcium carbonate) will be added to the rinse solutions to further adjust the pH of any fluids remaining in the leach pad. Once the rinsate has drained from the pad to the physical extent possible, and the pH's are within neutral ranges, the pad will be closed according to plans and requirements of the UDWQ/GWQDP.

The pad will then be covered with topsoil and revegetated. The implementation of the closure plan will be designed to prevent infiltration by surface water (primarily rainfall), and to subsequently eliminate the potential for long-term acid-bearing leachates to emanate from the leach pad, to either surface or groundwater.

Soils and Reclamation

Based on analysis of the Plan of Operations, as modified by the Mitigation and Monitoring Plan submitted by Summo (FEIS Appendix A), combined with recommended mitigation identified in the FEIS, impacts to soils will be minimal and reclamation efforts can be successful.

Erosion control structures will be placed in appropriate locations, as identified in the FEIS, to minimize erosion potential. Ephemeral surface drainages will be routed around all disturbed areas and will be constructed with appropriate grades and aprons. All post-mining surface drainage will be diverted away from the remaining open pits. Some soil loss is anticipated during construction activities, before sediment control and drainage designs are in place.

Topsoil from all areas to be disturbed will stripped, stockpiled and reseeded with the prescribed mix identified in the FEIS. These soils will be utilized to cover waste dumps, the leach pad and other disturbed areas prior to revegetation activities. Analysis indicates that stockpiled soil is of sufficient quantity to cover these disturbed areas with 11 to 12 inches of soil.

Based on concern with the proposed 2.5:1 ratio for final regraded slopes on the waste dumps and leach pad, Summo will be required to construct test plots on location during the life of the mine to analyze proposed final reclamation procedures and to assure that methods and procedures identified in their Mitigation and Monitoring Plan will in fact be effective. This will include construction of a test plot constructed at a 3:1 slope angle, to compare vegetative and erosion control effectiveness against the 2.5:1 slope proposed by Summo. If results of these tests indicate a greater probability of success for the 3:1 slope, all final dumps and the leach pad will be required to be graded to 3:1. This final decision will be based on BLM review of the test data, prior to closure of the mine and initiation of reclamation.

Vegetation

The results of vegetative surveys identified in the FEIS indicate no occurrences of Threatened or Endangered plant species within the project area. Analysis indicates impacts to vegetation will be short-term, resulting from the surface disturbance during the operation of the mine and facilities. A total of 1,103 acres will be disturbed during the life of the operation. Vegetative reclamation will occur on 872 acres, with the ultimate long-term loss of 231 acres associated with the open pits left after mining.

There would be some loss of plant diversity on 660 acres as a result of disturbance to soil structure when stockpiled soils are redistributed over the waste dumps and leach pad area. However, over time the density and diversity would increase, and disturbed communities are expected to achieve comparable cover and productivity in 3-5 years for grasses and forbs, 15-20 years for shrubs, and 80-100 years for

pinyon-juniper. Summo's Mitigation and Monitoring Plan (FEIS Appendix A), combined with requirements of the Mitigation and Monitoring section of this approval, will guide reclamation efforts, and may be subject to modification of species based on results of the test plots during the life of the mine.

Wildlife

The results of wildlife surveys indicate no occurrences of Threatened or Endangered wildlife species within the project area. The principal wildlife impacts will involve displacement of and temporary loss of some species during the life of the mine, principally a small year round population of deer. This displacement will result from increased human concentrations, traffic, night lighting, and noise.

Additionally, 266 acres of a 1433 acre prairie dog habitat will be covered by the heap leach pad. A survey for black footed ferrets, potentially associated with this prairie dog habitat, was conducted in consultation with the Utah Division of Wildlife Resources (UDWR) and the U.S. Fish and Wildlife Service (USFWS). The surveys identified no ferrets present.

The FEIS indicates potential for impact to waterfowl attracted to the solution ponds and post-mining pit lakes. The approval includes stipulations requiring mitigation of this impact in the event it occurs during the life of the mine or during long-term post-mine monitoring.

Additional mitigation will require Summo to enter into a Mitigation Plan with UDWR and BLM, to provide off-site habitat enhancement projects to mitigate displacement impacts. This agreement must be in effect within one year of the initiation of construction activities, and would include forage replacement and/or water source replacement activities.

Summo's use of an average of 907 acre feet of groundwater per year from the project site was determined to potentially effect water inflow into the Colorado River basin, and subsequently would effect endangered fish species in the Colorado and its tributaries by decreasing available water and habitat. Based on this potential impact, consultation was undertaken with the USFWS based on provisions of the Endangered Species Act. To mitigate this potential impact, FWS has required a depletion payment fee, based on the average rate of water depletion. This fee will be used by FWS to purchase additional water rights within the basin and enhance habitat for these fish species.

Ultimately, the primary impact to wildlife will be the loss of 231 acres of wildlife habitat as a result of the open pits remaining at the completion of mining operations. Based on the low levels of wildlife currently utilizing this area, this impact is not deemed to be major.

Grazing

There are two grazing allotments which will be impacted by the operation. Analysis in the FEIS indicates a short-term loss of 71.6 AUM's from these two allotments, representing 4% of AUM capacity for one allotment and less than 1% of the remaining allotment. These losses would result from surface disturbance of vegetation, and would occur only during the life of the mine.

After reclamation and revegetation, there would be a permanent loss of 7.23 AUM's from the two allotments, due to the 231 acres of unreclaimed open pits. On an overall basis, these impacts are considered to be minor.

Socioeconomics

Based on the analysis of issues in the FEIS, socioeconomic impacts to the surrounding communities are expected to be positive. New employment and earnings will be generated by the mine, in an area of higher than average unemployment. The FEIS analysis indicates the creation of 143 direct jobs and 54 indirect jobs, which will generate $5.6 to $7.4 million dollars annually in earnings These jobs will also help diversify the economy in southeast Utah, now primarily dominated by the recreation industry.

The analysis in the FEIS indicates housing is available for workers unless a large infusion of

in-migrants occurs. The analysis indicates however, that the majority of mine workers will come from the existing workforce in surrounding communities.

There will be some impact to local government infrastructure in the form of increased costs for road maintenance, fire, medical and emergency services. This will be offset by the increased tax base available to local government entities from the mining operation, estimated at an average of $235,000 annually in property tax (in San Juan County only), and $740,000 annually in sales taxes throughout the surrounding communities. There would also be $252,000 dollars generated annually in royalty payments from the state lands associated with the mine, portions of which will come back to San Juan County.

Closure of the mine will result in a loss of these jobs and tax base. However, the analysis indicates that at closure, job losses would amount to only 2% of available employment in the area. Therefore, closure of the mine would not have serious impact to the local economy.

Transportation

Transportation issues primarily involve increased volumes of traffic, potential for increased accidents, and anticipated maintenance requirements for local roads.

The analysis indicates mining operations would result in 75 round trips per day of commuter traffic coming from various directions from the surrounding communities. An additional 9 trips of heavy trucks and 12 trips per day of medium trucks would occur at peak operation. Based on underutilization of current traffic capacity on area roads, the analysis indicates minimal impact on overall traffic congestion in the area, with the exception of peak holiday weekends, principally in the Moab and Monticello areas.

Mitigation identified in the FEIS will require Summo to coordinate with Grand and San Juan counties on these peak holiday weekends, since the majority of congestion occurs on U-191. The results of such coordination will likely require Summo to have adequate supplies of materials on hand to get them through these peak periods without additional deliveries of supplies.

Calculations of increased traffic accident rates is complicated by the array of roads that would be utilized by traffic to the mine site. However, based on current traffic use and accident rates associated with the various road segments that would most likely be used, an increase of 2.44 accidents per year over the life of the mine would occur, representing a 2% increase in current accident rates.

Impacts to local road infrastructure are expected to be minimal. Increased costs would be offset by the increased tax base provided by the mining operation.

Hazardous Materials

The mining operation will utilize large quantities of hazardous materials for recovery of the copper. These include sulfuric acid, extractants, ferrous and cobalt sulfate, chlorine, oils and lubricants, ammonium nitrate, and various fuels. The use of these chemicals present potential impacts for vehicle accidents transporting these materials, and accidental releases of chemicals into the environment and worker exposure at the mine site.

Increased traffic accidents involving hazardous materials are projected at .5 to 1.6 accidents over the life of the mine, based on national averages of hazardous materials accident rates. Both Moab and Monticello have Emergency Response teams with some level of skill and capability in response to such accidents. Additionally, transporters of such material are trained for hauling such material and responding to such accidents. Summo will also have trained personnel and equipment available for response to such accidents in the project vicinity. Mitigation has also been included that will require Summo to provide training opportunities and equipment to the local emergency response teams to help in responding to such incidents.

The analysis indicates that with protective measures associated with storage and use of these materials at the mine site, the probability

of release to the environment, or worker exposure, is minimal. In the event of such release, Summo will have trained personnel available to deal with containment and clean up.

Cultural and Paleontological

Based on potential sensitivities associated with cultural resources in the greater Four Corners region, an extensive cultural resource survey was undertaken early on in the permitting process for this mine. These activities included on the ground survey and identification of sites, coordination with the State of Utah Historic Preservation Office (SHPO), and coordination and consultation with various Native American groups in the region with either current or historic affiliation to the area.

A Class III cultural resources inventory surveyed 3,640 acres of land in and adjacent to the project area and the powerline. A total of 364 archeological and historical cultural resource localities were documented, which included 186 isolated finds and 178 recorded sites. The 178 recorded sites consist primarily of camps, quarries, lithic procurement localities, lithic and sherd scatters, pinyon procurement localities, rockshelters, and a wickiup. The survey identified 23 of the 178 recorded sites as potentially eligible for listing to the National Register of Historic Places (NRHP).

The analysis of these eligible sites in relation to the mine disturbance indicates none of the eligible sites would be directly impacted by the operation. BLM subsequently made a Finding of No Effect, which was concurred with by SHPO.

Coordination with Native American groups in the region began in January 1996. Twelve regional groups were contacted to determine their concerns with the operation. The results of the consultation indicated no concerns with the project on the part of the groups. The Hopi tribe expressed concern with overall Native American coordination efforts within Utah, but indicated no specific concerns with this project. Mitigation is included in the approval to require additional coordination in the event the operation uncovers buried cultural resources.

Although formal letters of concurrence were not received from all contacted tribal groups, multiple phone calls were made, many letters were sent, and site visits were conducted with these groups in a good faith effort to provide them information and opportunity for input and comment regarding this project.

Possible indirect impacts could occur from the increased human presence in the area due to illegal collection or accidental disturbance. Mitigation will require marking of sites to eliminate accidental impact, and worker education to prevent illegal collection.

Visual

Topographic disturbance associated with the pits, waste dumps and leach pad will result in changes to the visual character at the project site. This impact will occur in a Class IV visual area, which is indicative of the lesser visual and scenic quality of the area when compared to visual resources throughout the overall region. Changes to visual characteristics, such as those associated with the mining operation, are allowed in Class IV areas.

Additionally, the project site is located in a low topographic area, not visible from surrounding areas, with the possible exception of the South Mountain peak in the LaSal Mountains, 25 miles north of the project site. The project will be highly visible to people traveling along the county road through Lisbon Valley.

The implementation of the Facility Layout alternative will mitigate visual intrusion to some degree by combining the proposed four waste dumps into three, although this will result in the remaining waste dumps being higher. Additional mitigation to visually blend facilities and surface disturbance impacts are identified in the Mitigation and Monitoring section.

Land Use

Issues identified for land uses include potential impacts to current land uses, and potential for future mining opportunities.

The analysis indicates current land uses are limited primarily to hunting and some dispersed recreation by local users. These uses would be curtailed during the life of the mine, but would return upon completion of successful reclamation work, with the exception of the 231 acres of open pits. These pits will be bermed, fenced and signed to warn users of the potential dangers and discourage use of the pits.

Potential for future recovery of lower grade copper ore would remain viable since the pits would remain open at the cessation of mining.

Climate and Air Quality

Analysis indicates there will be no impact to climate associated with the project. Air quality will be diminished at the mine site due to emissions primarily consisting of dust, with lesser amounts of particulates from the use of hydrocarbon fuels for machinery.

Air quality modeling indicates emissions will be within applicable federal and state standards. With the direction of prevailing winds in the area, no impact is anticipated to regional national parks or Wilderness Study Areas.

The impacts to visibility caused by dust associated with the operation will be local, and will cease when the mining operation is completed.

Noise

Due to the remoteness of the operation, impacts from noise will not be noticeable. The noise from machinery and activity will have impact on resident wildlife, likely causing them to abandon the area during the life of the mine.

Additional noise modeling for the project was conducted after release of the DEIS, based on concerns raised by property owners in the Three Step Hill and Summit Point area, roughly 5 to 6 miles south of the project site. The results indicate noise associated with the daily blasting could be faintly discernable to potential residents in this area, but otherwise pose no impact.

Recreation

Analysis indicates minimal impacts to recreational resources from the mining operation. There are no developed recreation sites in the vicinity of the project area. The area currently receives minimal recreational use. The uses that do occur are related primarily to hunting and dispersed activities by the local population. The area is not used by regional travellers and recreationists coming to southeast Utah. Current recreational use will return upon completion of mining operations.

D. ENVIRONMENTAL SUMMARY

Based on a comparison and analysis of overall impacts, combined with the mitigation incorporated in this decision, BLM's multiple use mandate under FLPMA, and rights granted to Summo by the 1872 Mining Law, the mining operation has been determined to be a viable and reasonable use for this area.

The operation is in conformance with land use planning for this area. The area has a history of mining and mineral recovery operations that date back to the early part of the century, and occurs in a historic mineral extraction and industrialized area of southeast Utah.

Environmental impacts will occur as a result of this operation, but are determined not to result in unnecessary or undue degradation of the land for this type of mining operation.

The primary impacts will be the potential for long-term water quality degradation from post-mining pit lakes and the potential geochemical make-up of those lakes. However, these impacts cannot be predicted with any degree of accuracy due to the complexity of the groundwater system in the area. In light of these uncertainties, Summo will be required to post a long-term reclamation bond and will be required to perform long-term monitoring of potential groundwater impacts, in an effort to provide long-term protection of the environment and public interest. The potential for impact to groundwater is greatly tempered by the remoteness of the area, the lack of historic or

current use, and the aquifers relative isolation from regional aquifers of importance.

Topography will be substantially altered, affecting the visual character of the area. However, the area is designated as a Class IV visual area, based on its visual characteristics. Additionally, the mining operation will not be visible from adjacent areas. The tourist and recreation industry in the region will be unaffected by the mine's location. Regional National Parks and Wilderness Study Areas will not be impacted.

The mine will provide diversity to the economy, and jobs to residents. However, the mine is not so large as to create adverse impact to regional infrastructure, or result in a major economic "bust" when it closes down.

Impacts have been mitigated to the extent feasible, incorporating all practicable methods to reduce environmental harm and minimize environmental consequences.

VI. MITIGATION AND MONITORING STIPULATIONS

Geological and Geotechnical

The authorized officer for BLM will monitor construction and installation of the mine facilities and will be allowed access at all times.

The operator will provide an independent registered professional engineer to review or monitor portions of the Quality Control/Quality Assurance (QC/QA) program (such as, but not limited to, the installation of the liner and leak detection system). The QC/QA program will be submitted to BLM for review 30 days prior to initiation of liner construction.

Hydrology

Annual Hydrologic Modeling

During the life of mining operations, Summo will annually re-evaluate the modeled output of the current "Vertical Model" (Adrian Brown Consultants 1996c). This annual re-evaluation will be based upon comparison of modeled output with cumulative water quality data obtained from dewatering, supply, and compliance wells as required by the UDWQ/GWQDP, and on cumulative hydrologic data obtained during the operational and closure phases. The first report will be due on January 30th of the year following initiation of mining, and on that date in each succeeding year. The annual report, will address:

- Potential for pit lake development following cessation of mining,
- Predicted pit lake water chemistry, and,
- Potential for adverse impact to the Entrada/Navajo aquifer. This report will also include the cumulative set of water data collected up to that point.

Leach Pad Monitoring Wells

Based on potential impacts to ground water quality from operation of the leach pad, Summo will be required to comply with all provisions of the UDWQ/GWQDP (see Appendix D in FEIS). The following provisions are included in the permit, and are highlighted here:

- Within 120 days of the issuance of the GWQDP, one leach pad groundwater compliance monitoring well will be installed on the east side of the leach pad.
- One additional compliance monitoring well will be installed for each expansion of the heap leach pad, i.e. stages 2, 3, and 4. These wells will be installed 180 days prior to operation of each additional leach pad section and will be located as near as possible to the southeast corner of each expansion. In the event that water is not found in the stage 1 or 2 wells, wells for stages 3 and 4 will not be required.
- A leach pad monitoring well schedule will be established based on UDWQ/GWQDP requirements. If monitoring indicates that solution from the heap leach pad is migrating into groundwater, remediation will be required.

Groundwater Monitoring Wells

Two Entrada/Navajo aquifer monitoring wells per pit will be installed downgradient of the Sentinel #1, Centennial, and GTO pits (for a total of six wells). Well sites are to be located within 100 feet of the ultimate pit margin for each of the three pits, unless otherwise approved in writing by BLM and UDWQ based on topographic or geological constraints. The location of theses wells will be selected in consultation with BLM and UDWQ. Each well will be screened in a 100 foot interval within the saturated portion of the Entrada/Navajo aquifer, unless otherwise approved in writing by BLM and UDWQ.

The first well will be drilled and completed downgradient of the Sentinel pit within 3 months of the initiation of site construction activities. The remaining five wells will be installed prior to the initiation of mining operations at the respective pits.

The wells will be sampled quarterly during the operational phase of the project. Wells may be required to be monitored for an additional 25 year post-closure period, dependent on results of the initial 5 year characterization and monitoring program. Each well would be sampled twice yearly for the first five years, and once yearly for the following 20 years, unless otherwise directed in writing by BLM..

If at any time, water samples are found to be out of compliance with the current UDWQ/GWQDP standards, then accelerated sampling and analyses will be required. Water samples will be collected and analyzed according to the current UDWQ/GWQDP guidelines.

BLM may require the collection of additional aquifer characteristic data sufficient to verify aquifer conditions or to improve groundwater flow or geochemical modeling (e.g. pump tests, slug tests, or water quality data for geochemical modeling).

Upon abandonment of additional water supply or dewatering wells on public land, BLM will be contacted 30 days prior to abandonment, to ensure that the appropriate plugging procedures are followed that are protective of the natural environment.

If at any time during monitoring, data and modeling indicate environmental impacts beyond the worst case scenario identified in the FEIS, additional NEPA analysis will be conducted to determine appropriate courses of action.

5 Year Post-Mining Pit Lake Monitoring and Water Quality Assessment Report

Based on potential impacts to downgradient ground water from pit lakes, Summo will be required to prepare a Post-Mining Pit Lake Monitoring and Water Quality Assessment Plan. This Plan will be submitted at the time Summo applies to UDWQ for a second 5 year GWQDP.

The Plan will be based on water quality data obtained from dewatering, water supply, and compliance wells as required by the UDWQ/GWQDP, in addition to geochemical testing data identified in the Geochemistry section of this approval. This Plan will include:

- Proposed action levels to be established by UDWQ for specific analytes (including antimony, arsenic, cadmium, copper, molybdenum, selenium, uranium, and zinc), TDS, and sulfates. These action levels will be based on the first five years of water quality and geochemical data collected according to the current UDWQ/GWQDP sampling analysis plan, and provisions of this approval.

- Potential treatment methods/remediation actions that will be utilized if analysis of data indicate long-term unacceptable impacts to groundwater. Cost estimates for remediation will also be provided.

- If the analysis indicates long-term impacts beyond acceptable levels, the plan will contain a sampling schedule that monitors post-mining pit water quality regardless of the amount of water in any given pit (i.e. intermittently ponded water will be sampled monthly until the pond has evaporated or drained, and continuous ponding will be sampled twice yearly for the first 5 post-

mining years and once yearly for 20 years thereafter). If sampling indicates the presence of contaminants in excess of actions levels, sampling will be accelerated in accordance with UDWQ guidelines.

- All data from water samples, monitoring tests and geochemical samples will be provided with this report.

This requirement for such a report and analysis will also apply at any time beyond the submission date for this initial 5 year report, if monitoring indicates unacceptable impacts, to groundwater, or indicates trends toward such impacts.

If pit lakes form and subsequent water quality does not meet UDWQ water quality compliance standards, the time frame for bringing pit lake waters into compliance with the current UDWQ/GWQDP will be five years, unless otherwise approved in writing by the UDWQ.

Surface Water Control Features

Diversion channels on the south and west sides of the Sentinel Pit will be required. Channels will be constructed using natural stream channel slopes and alignment. Channels will be scarified and seeded with an approved mixture of grasses and forbs immediately following construction. Maintenance and reseeding will continue throughout the life of the project until sufficient plant cover has been established to protect the channels from erosion.

A post-mining monitoring plan will include the diversion channels. If plant cover is insufficient to protect the channels from erosion, or if active erosion is occurring, maintenance and reseeding will be required.

Sediment collection structures will be left in-place until the heap leach pad, solution ponds, waste dumps, roads, and facilities have been reclaimed. The sediment collection structures will then be recontoured to the natural contour of the diversion channel, scarified, and seeded during project site final reclamation. Post-closure monitoring and maintenance will include the sediment collection structures.

Summo will be required to assure project components involved with placing fill materials in washes, are in full compliance with appropriate Army Corp of Engineer permits prior to initiation of construction operations. This will include assuring compliance with modifications to Army Corps Nationwide Permit 26, as modified February 11, 1997.

Geochemistry

Non-acid generating waste rock will be placed on post-mining pit bench surfaces below the outcrops of formations determined to be acid generating. This will reduce impacts to any pit lake waters by offering material to buffer potential acid leachates from these formations prior to entering the pit lakes below.

Due to potential for acid generation, waste rock from Dakota beds 6-8 (coal) and Dakota beds 9-10 (gray-pyritic shale) will not be used for either general construction or reclamation material.

In addition to sampling and Acid Base Accounting (ABA) testing of Acid Generating Potential (AGP) rock types (Dakota beds 6-8 and 9-10, described in the company Waste Rock Management Plan), Summo will also perform quarterly Meteoric Water Mobility Procedure (MWMP) testing on samples from each of the AGP rock types mined during the projects operational phase.

Summo will also schedule and perform quarterly ABA and MWMP testing of all neutralizing waste rock comprised of company-identified Acid Neutralizing Potential (ANP) rock types, mined during the projects operational phase. Any waste rock planned for use as construction and reclamation materials will also be included in the ABA and MWMP testing. Examples of construction materials include all ANP rock types planned for use as road base or surfacing materials. Examples of reclamation material include all ANP rock types selected to construct the engineered cap for the spent heap and to encapsulate the AGP waste rock.

The company will submit a sampling plan by ANP rock type for each pit to ensure that quarterly samples are obtained from all ANP rock types being mined as overburden or waste rock. This plan will be submitted prior to initiation of mining operations. At a minimum, these specific ANP rock types will be included in the plan:

- Mancos Shale
- Dakota beds 11-13 (sandstone)
- Burro Canyon bed 14 (mudstone)

Summo will sample monthly from each AGP and ANP rock type currently being mined and composite these monthly samples (by individual ANP rock type) for quarterly ABA and MWMP testing.

Summo will create a data base that relates quarterly ABA and MWMP data to the respective AGP and ANP rock type tonnage mined during that quarter. A copy of this data base, with a summary report, will be submitted yearly (January 30th) to UDWQ and BLM.

The location and extent of quarterly tonnage by individual AGP and ANP rock type will be plotted on the as-built map of each receiving waste dump.

Encapsulation of AGP waste rock will be defined as 40 feet of ANP waste rock laterally as well as above and below AGP waste rock.

Summo will plot the location, thickness and elevation of each AGP and ANP rock type on the as-built pit bench geologic map.

Summo will ensure that as part of the quarterly MWMP testing, each AGP and ANP rock type sample is analyzed for antimony, arsenic, cadmium, copper, molybdenum, selenium, uranium, and zinc. The following procedures will be utilized to accomplish this:

- The MWMP column-leach procedure will be used by leaching 5 Kg of each ANP rock type sample with 5 L of leachant comprised of Type II reagent water.

- If more than 48 hours are required for the MWMP column-leach procedure to produce a leachate with a mass equivalent to 70% of the dry test-sample weight, a bottle-roll leach procedure may be substituted (this will most likely apply to low hydraulic conductivity rock types such as claystones and bentonitic shales contained in the Dakota and Burro Canyon formations).

- The MWMP bottle-roll leach procedure will leach 3.5 Kg of each ANP rock type sample with 5.25 L of leachant comprised of Type II reagent water.

- Leachant pH for either the column- or bottle-roll-leach procedure will be adjusted to 8.5 with sodium bicarbonate.

If leachant concentrations exceed maximum contaminant levels, as identified by UDWQ, then BLM will reserve the option to also require additional kinetic testing to determine rates of release for the identified contaminant chemical species contained in specific rock types.

The above listed geochemical testing requirements will occur only during the life of the mine, unless it is determined that insufficient data has been obtained and additional post-mining testing is required to allow further characterization of rock unit geochemistry prior to developing final closure and long-term monitoring requirements. Such determination will be made by the BLM Authorized Officer. The BLM Authorized Officer also retains the right to modify requirements of waste rock and pit wall geochemical testing at any time such modifications or additional requirements are determined to be necessary.

Based on uncertainty of final pit lake geochemical impacts, Summo will be required to prepare and submit a geologic map of the Ultimate Pit Surface (UPS) for each open pit at the conclusion of mining in a given pit. The map will clearly identify:

- Outcrop areas of all rock type units.

- All geologic structural elements.

- Net acid generation potential (NAGP) for all rock type units exposed in the UPS.

- Final analyte concentrations (e.g. antimony, arsenic, cadmium, copper, molybdenum, selenium, uranium, and zinc), from MWMP tests of the last mined outcrop of each rock type exposed in the UPS.

- Hydraulic conductivities for all rock type units exposed in the UPS.

Based on review of Summo's Mitigation and Monitoring Plan (Appendix A in FEIS), during the last year of Waste Dump C construction, the AGP waste rock from the Centennial pit is scheduled to be placed in the final lift with only 1.5 times the ANP tonnage. Summo will be required to modify construction of Waste Dump C so that the final lift ANP:AGP ratio is no less than 4:1

Soils and Reclamation

The following erosion control, revegetation, and mitigation measures will increase the potential for successful reclamation of sites that will be disturbed through implementation of the Proposed Action. Additionally, the following mitigation measures will minimize impacts to the soils resource.

Erosion and sedimentation control measures and structures will be installed on all disturbed areas. Soil erosion control measures (including mulching, netting, tackifiers, hydromulch, or matting) will be used on sites in highly erosive soils, sites where surface runoff will be channelized, and steep areas. The type of control measure will depend on slope gradients and the susceptibility of soil to wind and water erosion (Table 3.4-1 in FEIS).

Runoff discharged from water bars or diversion ditches will be directed into undisturbed vegetation away from natural drainages to minimize rill and gully development along linear rights-of-way, such as roads or other facilities that could provide a channel for run-off. Water bars will be installed on all final slopes exceeding 25 feet in length and 10 % gradient.

Slope angles will be minimized where feasible to enhance retention of topsoil and reduce erosion. On slopes with angles of 2.5:1, 10 to 15 feet wide benches will be constructed at least every 30 to 40 feet with adequate erosion control structures constructed along slopes in between the benches to intercept runoff.

All runoff and erosion control structures will be inspected periodically, cleaned out, and maintained in functional condition throughout the duration of the project

The excavation of cover soil material will be limited to the A and B horizons; substrate material is not likely to provide suitable reclamation material and cover soil material will be handled separately from substrate materials to preclude mixing of the materials

Reclamation of the leach pad and waste dumps will include covering them with 2-3 feet of subsoils, not overburden rock, that can be ripped and prepared to support the layer of 12 inches of coversoil. This will provide an adequate rooting depth and enhance the potential for successful reclamation.

Prior to final reclamation activities, the leachate from the heap leach pad will be analyzed. The rinsing process will continue until effluent levels have reached standards acceptable to UDWQ identified in the second 5 year GWQDP. Alternate capping procedures may be considered and approved if they meet or exceed permeability specifications identified by UDOGM and UDWQ.

If a water balance cover is required to isolate the leachate at final reclamation, the slope of the heap leach pad may be reduced to 3:1, or less. The synthetic liner would be extended from the heap leach pad to contain the leachate materials when reducing the slope of the heap leach pad. Alternate slopes may be considered and approved, if the operator can demonstrate that a clay cap meeting or exceeding UDWQ specifications can be constructed along steeper slopes without increasing the potential for erosion of the water balance cover.

Stockpiled soil salvaged for reclamation will be seeded with a prescribed seed mixture (Section 4.5.2.2 in FEIS), and covered with mulch for protection from wind and water erosion and to discourage the invasion of weeds.

Revegetation test plots will include both slope angles of 2.5:1 and 3:1 and final regrading plans revised, if necessary. BLM, in consultation with UDOGM and UDWQ will make the final determination.

Vegetation

Although BLM has policies for using native plant species when possible, the use of non-native species will improve the potential for establishing perennial plant species and displacing undesirable, non-native annual species such as cheatgrass. The use of non-native species will maximize available precipitation, become quickly established to minimize erosion, and improve the potential for establishing other species. The following seed mixture will be used to stabilize top soil stockpiles and other surface disturbances:

Indian ricegrass	3 pounds/acre
Crested wheatgrass	3 pounds/acre
Tall wheatgrass	2 pounds/acre
Fourwing saltbush	2 pounds/acre
Bitterbrush	1 pound/acre
Yellow sweet clover	1/2 pound/acre

This seed mixture is a drill seeding rate and will be doubled if broadcast seeded. This mixture will be modified for final reclamation if the proposed test plots provide information that different species or quantities of seed will improve reclamation results. Any final changes or adjustments to seed mix will require written approval from BLM prior to initiation of re-seeding activities.

If shrubs cannot be re-established by seeding and the test plots indicate that shrub seedlings will be successful, shrub seedlings will be planted in conjunction with reseeding efforts.

Due to the length of time required for re-establishment of some vegetative species, reclamation monitoring will occur for 5 years after completion of seeding operations to assure the success of vegetative reclamation efforts.

All reseeded areas, with the exception of the powerline, will be fenced for a period of five years after seeding, fencing will be sufficient to preclude use and impact by livestock.

The authorized officer of BLM will inspect public land portions of the power line route after construction to determine the required rehabilitation measures. Rehabilitation will include those measures identified and deemed necessary by the authorized officer to ensure successful mitigation of the impacts from the construction operations. Rehabilitation measures will include the following techniques when necessary:

- Scarification of vehicle tracks that are visible from existing roadways.
- Scarification of soil compacted during operations.
- Seeding of the scarified areas with a seed mixture provided by the San Juan Resource Area for the power line route.
- Rehabilitation of existing trails used for access during the construction operations.
- Installation of barriers or signs to prevent future vehicle use across routes used during construction operations.

Vegetation monitoring will include inspections for signs of phytotoxicity, and in the event it occurs, sampling and analysis of the vegetation will be necessary to develop an appropriate mitigation plan.

Wildlife

In cooperation with UDWR and BLM, Summo will conduct a big game habitat enhancement project to reasonably mitigate impacts to native vegetation and watering sources from the mining operation. The specifics of this project will be identified and implemented through the preparation and approval of a Mitigation Plan, cooperatively agreed to by the identified participants, which will be developed within one year of initiation of construction activities.

The habitat enhancement project may include, but will not be limited to, vegetation manipulation through burning, spraying, biological control, plowing, chaining, fertilization, or reseeding. In addition, new wildlife watering sources will be constructed within the Lisbon Valley area for compensation of the water sources lost from mining operations. In the event of disagreement between parties to the agreement, BLM will make final determinations as to components of the plan.

Based on monitoring by BLM and UDWR, if wildlife mortalities occur as a result of contact with the process ponds during operation, corrective action will be taken. This will also apply to long-term monitoring of lakes that could potentially develop in the post-mining pits. Specific measures used to mitigate such impacts will be developed in coordination with the BLM and UDWR.

The 8 foot fencing constructed around solution ponds will include 4 feet of small mesh along the bottom to prevent small mammals from entering the pond areas.

If raptors are found nesting within the project area during construction, BLM and UDWR will be contacted to verify the species and to determine if any additional mitigation measures are necessary.

Warning balls or other visual warnings will be placed along the following power line section to prevent raptors from colliding with power lines stretched across canyons:

The span across Dry Wash in section 5, T. 31 S., R. 25 E.

Summo will be required to pay the full balance due on the water depletion fee established by FWS prior to initiating construction activities,

Grazing

All reseeded areas will be fenced from livestock grazing for a period of five years after reseeding, or until written permission is obtained from the BLM Authorized Officer to remove at an earlier date.

Socioeconomics

In light of the overall assessment of positive impacts to socioeconomic conditions in the region surrounding the project site, the only mitigation of socioeconomic impacts that could be identified will consist of encouraging Summo to hire local area workers to the greatest extent possible. This will minimize the need for recruiting non-local workers who will move to the study area and increase the demand for permanent housing and local government services and community facilities. Although this mitigation is identified, it is realized that there is no legal mechanism to force Summo to comply.

Transportation

To the extent feasible, Summo will encourage carpooling by mine staff to reduce the number of commuter vehicle trips to and from the mine site, thereby reducing traffic volumes and further reducing road wear, and potential accidents.

Summo will coordinate with local community agencies (i.e., Highway Patrol, County Sheriff, City police and fire departments, etc) in Grand and San Juan counties regarding the hauling of hazardous materials and other supplies during heavy weekend "event" periods, particularly in the Moab area. Summo will attempt to secure supplies sufficient to carry them through these identified time periods.

Hazardous Materials

Summo will be provide 14 day prior notification to all local emergency response groups, of dates and locations of company sponsored emergency response training, to assure they are provided the opportunity to participates in all training dealing with response to any potential accidents involved with hauling hazardous materials to the project site. Summo will provide this training to local groups at no cost. In addition, Summo will provide any specialized response equipment to these teams necessary to respond to emergencies involved with trucks transporting hazardous materials to the project site.

Cultural and Paleontological Resources

Several treatment measures can be taken to assure impacts do not occur to cultural sites. Site avoidance is preferred, followed by site protection and data recovery and analysis. It is anticipated that site avoidance will be the only measure necessary for the Proposed Action including the proposed power line.

To assure that the 23 NRHP eligible historic properties are avoided, their boundaries will be established by a professional archaeologist and the boundaries of sites in the vicinity of construction and operations will be marked and signed during the life of operations so that ground disturbing activities will not occur in these areas. The proponent's personnel will be educated about the importance of avoiding impacts to these areas. They will also be informed of what evidence might be found that will indicate the presence of previously buried cultural resource.

In addition to the 23 NRHP eligible sites, there are non-eligible sites in the project area. To mitigate the effect of loss of a large number of individually non-eligible sites, an analytic study of known and previously inventoried cultural data in Lisbon Valley, will be completed prior to initiation of mining operations. This report will synthesize and preserve the data represented in the non-eligible sites.

Due to the number of cultural sites identified along the power line route and the complexity of developing mitigation for the sites, an archaeological avoidance plan has been prepared. Utah SHPO has concurred with the plan, and the plan will be incorporated into the Right-of-Way Grant as stipulations. This plan describes the required detailed procedures for mitigating potential impacts to cultural resources during the construction, operation, and maintenance of the power line.

In order to ensure that the procedures for archaeological avoidance will be implemented:

- The BLM Right-of-Way Grant will stipulate that the procedures for archaeological avoidance will be followed during all phases of construction, operation, maintenance, and abandonment.

- There will be a pre-work conference with the BLM, the holder of the Right-of-Way Grant, construction contractors, and an Archaeological Consultant. During the pre-work conference, each site identified in the archaeological avoidance plan will be inspected, and avoidance procedures from the plan will be discussed.

- If future expansion of the project extends beyond the area of cultural resource study, additional cultural resource inventories and mitigation will be required.

- If buried cultural resources are encountered as a result of mining or other surface disturbing operations, work at that location will be stopped immediately and BLM notified within 24 hours. Work will not be allowed to resume until written approval is received from the BLM Authorized Officer, after any necessary consultation with SHPO or affected Native American groups.

Visual Resources

For reducing visual contrasts, several types of mitigation will be employed. These will include: (1) siting facilities in less visible locations, (2) minimizing disturbance; and (3) repeating the basic elements of line, form, color and texture found in the surrounding landscape.

Depending on the facility, several of the following mitigation's will reduce visual impacts:

- During construction, clearing of land for stockpiles and other project facilities will create curvilinear boundaries, instead of straight lines, where not in conflict with requirements to construct slopes breaks and waterbars necessary to stabilize areas from erosion.

- Grading will be done in such a manner that will minimize erosion and conform to the natural topography.

- Contrasts in color and texture will be minimized by revegetating disturbed areas as quickly as possible.

- The visual contrast of structures will be reduced by locating the facilities to take advantage of any available topographic screening, and by using colors that blend with colors found in the surrounding landscape and using finishes with low levels of reflectivity.

Land Use

No mitigation measures will be required beyond berming, fencing and signing of the open pits to prevent post-mining public access.

Climate and Air Quality

Summo will comply with all requirements identified by the State of Utah Air Quality Permit.

Noise

Blasting will be limited to no more than once per day, in order to mitigate to the extent possible, impacts to potential landowners and residences at Summit Point and Three Step Hill.

Recreational Resources

Recreation impacts that will occur as a result of construction and operation of the proposed project will be reduced through the application of the following committed mitigation procedures:

- Signing to will be installed to warn the public of construction and speed limit signing will be posted.

- Enforcement of property boundary closure requirements to prevent unauthorized motorized use of the access roads and to prevent hunting accidents.

VII. PUBLIC INVOLVEMENT

A. Public Scoping and DEIS Review and Comment Period

The EIS process for Summo's proposed copper mining operation has had extensive public involvement from the onset.

The initial application from Summo, in the form of a Plan of Operations, was submitted to BLM on August 8, 1995. After initial review by BLM, letters went back and forth between BLM and Summo clarifying information and providing additional information for the initial review. After it was determined that the Plan of Operations was complete, it was determined that, based on the level of disturbance associated with the proposal, an Environmental Impact Statement would be required.

A news release was distributed on September 28, 1995 to local and regional newspapers identifying the EIS effort, the dates and locations of the scoping meetings, and the time frames for providing written scoping comments

A Notice was published in the Federal Register on October 5, 1995 indicating a Notice of Intent to prepare the EIS. The Federal Register Notice also identified two public scoping meetings to receive input from the public. The first meeting was held in Moab, Utah on November 1, 1995. The second meeting was held on November 2, 1995 in Monticello, Utah. The Notice of Intent also indicated that written scoping comments would be received until November 30, 1995.

Letters were sent to the San Juan and Grand County Commissions, in addition to potentially affected state and federal agencies on October 25, 1995, soliciting input on scoping issues.

A total of 18 individuals attended the scoping meeting in Moab, and 15 individuals attended the meeting in Monticello. Additionally, 12 written responses were received on scoping issues.

On November 11, 1995, BLM placed notification of the pending EIS on the Utah BLM Electronic Notification Board, which is a computer

accessible electronic listing of pending NEPA related projects on BLM land throughout the state.

In addition to the formal scoping meetings in Moab and Monticello, at the request of the San Juan County Commission, BLM participated in an informal presentation of the mine proposal with Summo at a town meeting in LaSal, Utah on January 9, 1996. Approximately 35-40 individuals were present at that meeting, and their concerns were added to the list of issues to be addressed in the EIS process.

Initial letters were sent to several Native American groups on January 17, 1996 initiating consultation with those groups. These groups were selected based on known past or current affiliation with the project area. Several follow-up letters, phone calls, and site visits where also conducted with interested tribal groups, along with being provided copies of the DEIS, FEIS, and appropriate cultural resource inventory data.

A Draft EIS was prepared and released to the public on May 16, 1996. The Notice of Availability of the DEIS was published by BLM in the Federal Register on May 10, 1996. Distribution of the DEIS was initiated on May 16, 1997. The Environmental Protection Agency (EPA) published the Notice of Availability in the Federal Register on May 31, 1996. These Notices of Availability identified a 45 day public comment period, starting with the EPA publication date, in addition to a public meeting to be held in Moab, Utah on June 12, 1996. A news release was also prepared and distributed to local and regional newspapers on May 30, 1996 identifying the availability of the DEIS, the comment period and the date for the public meeting.

A total of 27 individuals attended the public meeting on June 12, 1996. A certified court recorder transcribed formal minutes and comments presented at the meeting. A total of 24 written comments were received on the DEIS, in addition to 4 formal verbal comments presented at the public meeting.

The FEIS was released on February 14,1997. BLM publication of the Notice of Availability of the FEIS was published in the Federal Register on February 14, 1997. The EPA also published their Notice of Availability in the Federal Register on that same date. Both notices identified a final 30 day review period on the FEIS, starting on the date of EPA publication. A news release was distributed to local and regional newspapers on March 3, 1997.

B. FEIS Public Review Comments

During the 30 day FEIS public review period, BLM received 9 letters providing opinions and comments on the FEIS, and two letters requesting an extension of the 30 day public review period.

The requests for an extension of the 30 day review period were received from the National Wildlife Federation (NWF) and the Rio Pueblo/ Rio Embudo Watershed Protection Coalition. The NWF sent two extension request letters. The first was dated March 11, 1997 and was received by fax at the BLM Moab District Office on March 12, 1997. This letter was also signed by the Minerals Policy Center and the Sierra Club, in addition to 21 concerned citizens. A second request was sent by letter dated March 14, 1997, and received by fax on the same day. The rationale for the extension identified in the two letters included:

- The technical nature of the FEIS was to complicated to be reviewed in 30 days,
- BLM had provided inadequate public notification of the proposal,
- The FEIS failed to comply with other federal laws,
- The FEIS contained inadequate baseline data on aquifers in the area,
- Reclamation plans were inadequate,
- The FEIS did not adequately consider impacts to groundwater from post-mining pit lakes,
- The EIS process did not provide adequate consultation with Native American groups,
- The FEIS did not consider impacts from hydrogen sulfide gas,
- Riparian surveys were not conducted in McIntyre Canyon, and
- The approval process did not follow provisions of the Endangered Species Act.

The extension request from the Rio Pueblo/Rio Embudo Watershed Coalition identified additional concerns as follows:

- Water use discrepancies,
- Incorrect baseline analysis of precipitation,
- Monies paid for depletion fee allowance on impacts to endangered fish species, and
- Long-term bonding and timeframe for posting of the long-term bond.

After consideration of the request and rationale for extending the public review period, BLM determined that the requests presented no pertinent issues which had not been adequately addressed in the FEIS, and that public participation and notification of the EIS process had been adequate. The request for review period extension was subsequently denied by BLM in a letter dated March 21, 1997.

The FEIS did not address the issue of Hydrogen Sulfide (H2S) forming in the leach pad. This was not addressed due to unlikely potential for this to occur. This is based on the extremely low pyritic phase of the mineralogy of the ore being leached, the low concentration of sulfuric acid utilized in the heap leach fluids, and the ongoing chemical oxidation and bacterial action in the heap leach pad that would consume any elemental sulfur that may occur as a reaction between hydrogen sulfate and zinc sulfide. As a result of the improbability of H2S occurring, it was not felt necessary to modify the FEIS to address such occurrence.

The public review letters brought forth the additional summarized comments and concerns:

- Inadequate baseline information regarding hydrologic characteristics, particularly regarding the Navajo aquifer,
- Permanent loss of public lands as a result of leaving the mine pits open upon closure of mining operations, the subsequent development of "toxic" lakes in the pits, and the potential for acid generation from the reclaimed waste dumps,
- Potential for waterfowl fatalities in the abandoned post-mining pit lakes,
- Impacts to groundwater quality from post-mining pit lakes,
- Impacts to water flows in the Dolores River and endangered fish species in the Colorado River basin,
- Potential for hazardous chemical spills from trucks transporting chemicals to the mine site,
- Accident hazards due to increased traffic in the area,
- Risks to school children potentially being bused to school through the mine site,
- Public exposure to radionuclide minerals incorporated in the water utilized for dust suppression
- Financial assets of Summo USA to assure reclamation and remediation of potential long-term impacts,
- Leach pad liner leaks,
- Seismicity of area/faulting potential,
- Loss of groundwater resources,
- Inadequacy of explanation of Endangered Species Act consultation with USFWS,
- Vagueness of the wildlife habitat enhancement plans, and
- Inadequacy of fencing around project site for protection of wildlife.

With the exception of the potential for impact to school children being bused to school through the mine site, the FEIS addressed all of the above listed issues. The busing issue was not addressed because there are no school children currently being bused through this area, and BLM has no indication that such would occur in the future. It was therefore determined that this was not an issue.

Issues brought forth in these letters indicated they fell into one of four categories.

- They are beyond the scope of the EIS (i.e. Summo's financial status),
- Indicate disagreement with the conclusions presented in the EIS without providing information to refute the conclusions,
- Disagree with the decision to approve the project, or
- Identify concerns that are not issues requiring analysis.

Subsequently, the ROD does not present a formal response to these issues, but relies on the information presented in the FEIS to answer these concerns.